FOLEY & LARDNER
ATTORNEYS AT LAW
777 EAST WISCONSIN AVENUE, SUITE 3800
MILWAUKEE, WISCONSIN 53202-5306
TELEPHONE: 414.271.2400
FACSIMILE: 414.297.4900
WWW.FOLEYLARDNER.COM

# FACSIMILE TRANSMISSION

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| Audrey Chang, Examiner<br>U.S. Patent and Trademark Office | 703-305-6208 | 703-872-9319 |

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| **From :** | Alistair K. Chan |
| **Email Address :** | achan@foleylaw.com |
| **Sender's Direct Dial :** | 414.297.5730 |
| **Date :** | May 20, 2003 |
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**MESSAGE:**

This is regarding Application No. 09/630,883.

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**EXAMINER: AUDREY CHANG FOR INTERVIEW PURPOSES ONLY**

**INTERVIEW DISCUSSION POINTS**

1. (1) The Examiner objected to the optical signal being "modulated", as new matter. Modulation generally means to vary the property of an electromagnetic wave or signal for the carrying of information. The application describes light signals which may be turned on and off, and thus, carry digital information, i.e. modulated.

(2) The Examiner objected to the modulated optical input signal having the same wavelength and phase as the optical bias optical signal, as new matter.

FIG. 7 depicts the optical physics behind the optical processing techniques described in the application. FIG. 7 shows a single light source being provided to two slits (i.e. light inputs to an interference region between the slit plate and plate 110). (See also, specification at page 5, line 20 – page 6, line 12.). Accordingly, because light is provided from single light source 85, the input to interference region between slits 90 and 95 and plate 110 have the same wavelength and phase. Accordingly, if one of the slits is chosen as the optical bias signal, that is, it is always in the lighted on condition, and the other slit is chosen as the modulated optical input signal, that is, it can be selectively turned on and off, one can easily see that providing a modulated optical input signal having the same wavelength and phase as an optical bias signal, is clearly disclosed in the application and should not be deemed new matter.

(3) The Examiner states that "interference being based on the location of the first optical pathway with respect to the second optical pathway entering the interference region and length of the interference region and the location of the third optical pathway...the third optical pathway being the function of the wavelength and the length of the interference region and the distance between the first and second optical pathways," is deemed new matter by the Examiner.

The description again relating to FIG. 7 on page 5, line 20 – page 6, line 12, describes the type of calculation needed using Young's expression that results from his famous double-slit experiment and is very well known to those of ordinary skill in the art. These equations have been well-published and studied. As similarly stated on page 6, "using an expression associated with Young's experiment" can be explained as two light rays having the same properties passing through two input optical pathways, separated by a distance d and strike a light in the isolated interference box (i.e. interference region) of opposite side at a distance, L, from the input slit side of the isolated interference box, as in FIG. 1.

In the invention described, the first optical pathway is lighted all the time as an optical bias, and the second optical pathway is being binary modulated (i.e. on and off) as an optical signal. The output slit in the isolated interference box is located at the opposite side of the input slits (as depicted in FIG. 5, e.g.). The location of the output slit is calculated based on Young's experiment during operation. If no optical signal is presented (i.e. input logic 0), then the bias light

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has no destructive interference within the box therefore the light will appear at the output slit (i.e. output logic 1). See, for example, page 8, Table IV. If there is an optical signal presented (i.e. input logic 1) then destructive interference occurs with bias light within the isolated interference box resulting in a dark band at the output slit (output logic 0). Accordingly, for all of the reasons stated above, the material quoted by the Examiner is not new matter, as it is supported by the specification.

6. The antecedent basis problems in claim 1, 11, 31, and 36 will be corrected. Also, in claim 31 we suggest changing "in and always on condition" to "in a constantly lighted condition."

8.-9. The Examiner has rejected the claims as obvious over the prior art.

The structure of Applicant's invention differs from any combination of prior art because of the structure described by Applicant which comprises a plurality of optical pathways that are patterned on a substrate. The optical pathways include an interference region and the interference region and optical pathways are configured in such a way as to provide interference within the interference region and to an output pathway when specific combinations of input signals are applied.

Utaka teaches that it is possible to use the well known Mach-Zender interferometer principle along with a complex device processing to design an integrated optical system based on the light phase modulation. (See, for example, FIG. 7, 8A, 8B, and 10.)

Yang teaches that it is possible using well known Young's double-slit principle to cascade a series of light isolated chambers with electrically and/or mechanically operated shutters to build a discrete optical system. (See, for example, FIG. 6).

We, however, claim the use of Young's double-slit principle with conventional semi-conductor-type device processing techniques to provide an integrated optical system. Accordingly, Applicant's see no suggestion or motivation to combine the teachings of Utaka and Yang to arrive at the claimed invention.

12. The Examiner has maintained the drawings objection. Applicant's would be glad to provide a new drawing which incorporates what is shown in FIG. 2 and FIG. 8, for example, as a Figure depicting the optical pathways and layers forming an optical processing device.